Small Business Innovation Research/Small Business Tech Transfer

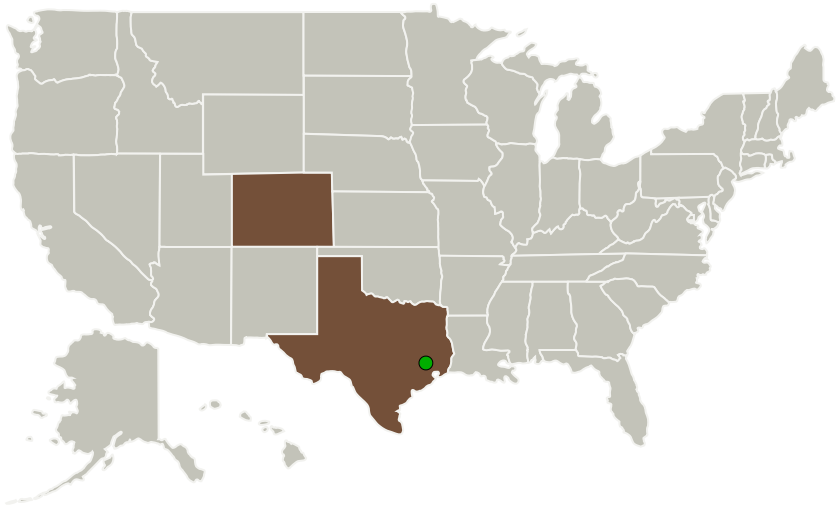
Silver Biocide Analysis & Control Device, Phase I

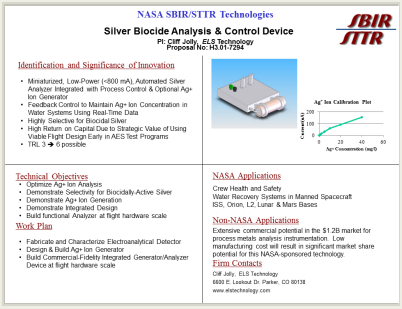
Completed Technology Project (2016 - 2016)

Project Introduction

Rapid, accurate measurement and process control of silver ion biocide concentrations in future space missions is needed. The purpose of the Phase I program is to develop an electroanalytical device for analysis and process control of biocidal silver in potable water, with the option integrating an Ag+ ion generator. The device will automatically provide continuous and on-demand maintenance of Ag+ ion biocide levels in spacecraft water streams and storage tanks, as well as providing output data for silver concentrations and a profile of total silver added to the system over time. Considerable test work is planned under the AES program and, given silver ion's 'elusiveness' in water systems, the data will be far more reliable if the methodology for adding the biocide and measuring its concentration is performed by a reliable and flight-qualifiable design from the beginning. The Phase I Technical Objectives are to develop the device specifications, software and hardware to conform to spacecraft applications as specified by NASA. The specific objectives will be to 1) develop a complete analytical characterization of the detection method, inclusive of automated autocalibration and QA/QC functions, 2) demonstrate the Feedback Control Function to maintain consistent Ag+ ion concentration in active water systems, and 3) determine the operating parameters required to generate Ag+ in the ranges of 0.05-40 mg/l in potable water. Phase I will culminate in a complete analytical methodology and a flight preproduction prototype for measurement and control of silver ion at sub-ppb levels in finished waters.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Environmental and Life Support Technology, Inc.	Lead Organization	Industry	Parker, Colorado
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Colorado	Texas

Project Transitions

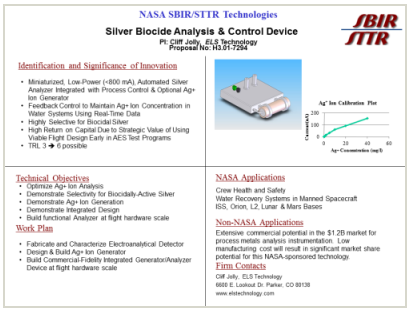
June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139596)*

Images



Briefing Chart Image
Silver Biocide Analysis & Control Device, Phase I
(https://techport.nasa.gov/image/132113)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Environmental and Life Support Technology, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

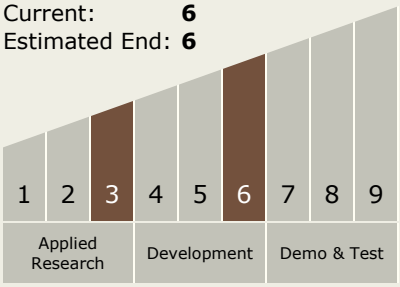
Carlos Torrez

Principal Investigator:

Clifford Jolly

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



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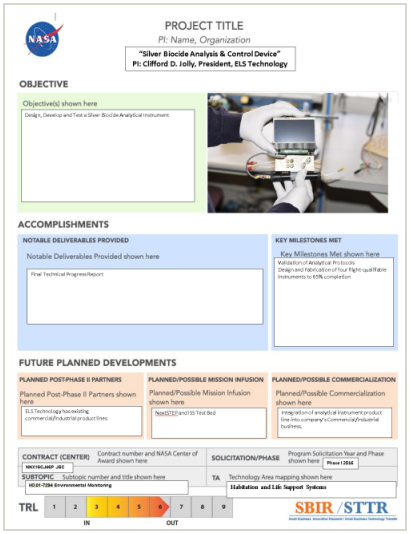

Final Summary Chart Image
Silver Biocide Analysis & Control Device, Phase I Project Image *(https://techport.nasa.gov/image/128041)*

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System